

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A spinal fixation system, comprising:
at least two bone anchors having a bone-engaging portion and a rod receiving portion with opposed arms that receive a rod therebetween;
a rod disposable between the opposed arms of the rod receiving portion of the at least two bone anchors for connecting the bone anchors; and
a connecting plate extending having a distal surface that bears against from a proximal terminal end surface of the opposed arms of the rod receiving portion of at least one of the bone anchors.
- 2-3. (Canceled)
4. (Previously Presented) The spinal fixation system of Claim 1, further including a set screw that threadably engages the rod receiving portion, whereby the set screw contacts and fixes the rod to the bone anchor.
5. (Original) The spinal fixation system of Claim 4, further including a cap that threadably engages the set screw, whereby the cap fixes the connecting plate to the rod receiving portion of the bone anchor.
6. (Original) The spinal fixation system of Claim 5, wherein the connecting plate defines an opening at an end and a spanning portion extending from the end, and wherein the set screw or the cap extend through the opening when the connecting plate is fixed to the bone anchor.
7. (Original) The spinal fixation system of Claim 6, wherein the connecting plate includes a buttress at a distal side of the spanning portion.
8. (Original) The spinal fixation system of Claim 7, wherein each of two sets of bone anchors are connected by rods and wherein the two sets of bone anchors are connected to each other by connecting plates.

9. (Previously Presented) The spinal fixation system of Claim 6, wherein the proximal surface of the bone anchor has a bearing surface that mates with the connecting plate and wherein the connecting plate has a distal bearing surface that is domed.
10. (Original) The spinal fixation system of Claim 9, wherein the domed bearing surface of the connecting plate is spherical or conical.
11. (Original) The spinal fixation system of Claim 10, wherein the cap has a distal bearing surface that is chamfered or domed.
12. (Original) The spinal fixation system of Claim 11, wherein the connecting plate has a proximal bearing surface that mates with the distal bearing surface of the cap.
13. (Original) The spinal fixation system of Claim 11, further including a floating washer, the floating washer including a bearing surface that mates with the distal bearing surface of the cap, and rails that slidably engage the connecting plate, whereby the connecting plate is fixed to the bone anchor by compression between the floating washer and the bone anchor.
14. (Original) The spinal fixation system of Claim 13, wherein the distal bearing surface of the cap is domed.
15. (Original) The spinal fixation system of Claim 5, wherein the cap threadably engages the set screw at a threaded bore defined by the cap.
16. (Original) The spinal fixation system of Claim 5, wherein the cap threadably engages a threaded bore defined by the set screw.
17. (Original) The spinal fixation system of claim 1, wherein the connecting plate is oriented at an angle in a range between about 20° and about 160° relative to the rod.

18. (Original) The spinal fixation system of claim 1, wherein the connecting plate is oriented at an angle in a range between about 60° and about 120° relative to the rod.
19. (Previously Presented) The spinal fixation system of claim 1, wherein the connecting plate defines an opening at an end and a spanning portion extending from the end.
20. (Previously Presented) The spinal fixation system of Claim 19, wherein each end is fixed to a proximal surface of a bone anchor.
21. (Original) The spinal fixation system of Claim 19, wherein the spanning portion of the connecting plate is arcuate.
22. (Original) The spinal fixation system of Claim 21, wherein the spanning portion has a radius of curvature in a range of between about 8mm and about 12mm.
23. (Original) The spinal fixation system of Claim 21, wherein the spanning portion has a radius of curvature in a range of between about 5mm and 15mm.
24. (Original) The spinal fixation system of claim 19, wherein the spanning portion is offset from a plane defined by the end of the connecting plate.
25. (Original) The spinal fixation system of claim 24, wherein the spanning portion is offset at least about 3mm from the plane defined by the end of the connecting plate.
26. (Original) The spinal fixation system of claim 24, wherein the spanning portion is offset between about 5mm to about 10mm from the plane defined by the end of the connecting plate.
27. (Previously Presented) The spinal fixation system of Claim 19, wherein the openings defined by the connecting plate each independently have at least a portion of a shape selected from the group consisting of a circle and an ellipse.

28. (Previously Presented) The spinal fixation system of Claim 19, wherein the opening defined by the connecting plate is open-ended.
29. (Original) The spinal fixation system of Claim 1, wherein the bone anchors are each independently selected from the group consisting of a polyaxial screw, a monoaxial screw and a bolt.
30. (Original) The spinal fixation system of Claim 29, wherein the bone anchors include at least one polyaxial screw.
31. (Previously Presented) The spinal fixation system of Claim 1, wherein the distal bone anchor portion is a polyaxial screw that includes a head that mates with the rod receiving portion and a bone screw portion, whereby the bone screw portion pivots about a point at the head of the bone screw portion.
32. (Original) The spinal fixation system of Claim 31, wherein the proximal surface of the rod receiving portion is spherical and has a radius of curvature that extends from the point about which the bone screw portion pivots.
33. (Original) The spinal fixation system of Claim 32, wherein the connecting plate defines an opening at an end of the plate and wherein the opening has a bearing surface that mates with the proximal surface of the bone anchor.
34. (Original) The spinal fixation system of Claim 32, further includes a set screw that threadably engages the rod receiving portion and a cap that threadably engages the set screw, the cap including a distal bearing surface that has a radius of curvature that extends from the point about which the bone screw portion pivots.

35. (Original) The spinal fixation system of Claim 34, wherein the polyaxial screw further includes a compression member between the rod and the head of the distal bone screw portion of the polyaxial screw, the compression member including a rod seat that substantially mates with the rod.

36-55. (Canceled)

56. (Currently Amended) A spinal fixation system, comprising:
a first set of at least two bone anchors having a bone-engaging portion and a receiving portion with opposed arms that receive a fixation element therebetween;

a second set of at least one bone anchor;
a fixation element disposable between the opposed arms of the receiving portion of the at least two bone anchors of the first set for connecting the bone anchors of the first set; and
a connecting plate connecting a bone anchor of the first set with a bone anchor of the second set, the connecting plate having a distal surface that bears resting against a proximal terminal end bearing surface of the opposed arms of the on a rod-receiving portion of the bone anchor of the first set and a proximal bearing surface on a rod receiving portion of the bone anchor of the second set; and
a closure mechanism extending through the connecting plate and engaging one of the bone anchors to fix the fixation element within the bone anchor.

57. (Currently Amended) The spinal fixation system of claim 56, wherein the bone-engaging portion of at least one bone anchor includes a distal portion including a bone screw portion and a head that mates with the rod-receiving portion, whereby the bone screw portion pivots about a point at the head of the bone screw portion.

58. (Canceled)

59. (Currently Amended) The spinal fixation system of claim 57~~claim 58~~, further comprising a cap engageable with the closure mechanism to fix the connecting plate to the bone anchor.

60. (Currently Amended) A method of fixing vertebrae relative to each other, comprising the steps

of:

implanting a first bone anchor and a second bone anchor in a first vertebra and a second vertebra, respectively;

connecting the first and second bone anchors with a fixation element; and

positioning a distal surface coupling one end of a connecting plate on to a proximal terminal end bearing surface of opposed arms of a rod receiving portion of the first bone anchor by inserting a closure mechanism through the connecting plate to engage the rod receiving portion.

61. (Original) The method of Claim 60, further including the steps of:

implanting a third bone anchor in the first vertebra on a side of the spine opposite the first bone anchor, the third bone anchor including a proximal bearing surface, and

coupling the connecting plate to the proximal bearing surface of the third bone anchor.

62. (Original) The method of Claim 61, wherein the fixation element is a rod.

63. (Original) The method of Claim 61, further including the steps of:

implanting a fourth bone anchor in the second vertebra on a side of the spine opposite the second bone anchor, the fourth bone anchor including a proximal bearing surface, and

coupling a connecting plate to the proximal bearing surface of the second bone anchor and to the proximal bearing surface of the fourth bone anchor.

64-72. (Canceled)